manufacturing process makes it possible to achieve more efficient manufacturing process in which the variation in the product is small. Hence, it is possible to improve the yield.

IN THE CLAIMS:

Please cancel claims 5-8 and 10-16 without prejudice to or disclaimer of the subject matter contained therein.

REMARKS

Claims 1-4 and 9 are pending. By this Amendment, the specification is amended, and claims 5-8 and 10-16 are cancelled without prejudice or disclaimer. Reconsideration based on the above amendments and following remarks is respectfully requested.

The attached Appendix includes marked-up copies of each rewritten paragraph (37 C.F.R. §1.121(b)(1)(iii)).

I. THE SPECIFICATION SATISFY ALL FORMAL MATTERS

The Office Action objects to the specification because of an informality. The specification is amended in accordance with the Examiner's recommendation to obviate the objection. Withdrawal of the objection to the specification is respectfully requested.

II. THE CLAIMS DEFINE ALLOWABLE SUBJECT MATTER

The Office Action rejects claims 1-5 under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 5,494,835 to Bruel (hereinafter "Bruel '835") in view of U.S. Patent No. 5,374,564 to Bruel (hereinafter "Bruel '564"); and claims 6-9 under 35 U.S.C. §103(a) as unpatentable over Bruel '835 in view of Bruel '564 and further in view of U.S. Patent No. 6,271,101 to Fukunaga (hereinafter "Fukunaga"). The rejections are respectfully traversed.

The Office Action rejects claim 1 essential as follows:

> The elements of the invention recited in claim 1 are, in rough, (i) forming an insulation film on a semiconductor substrate, (ii) forming an ion shield member on the insulation film, (iii) implanting ions into the semiconductor substrate, thereby forming an ion implantation layer, (iv) removing the ion shield member, (v) laminating the insulation film

and a support substrate, and (vi) separating the semiconductor substrate from the support substrate at the portion of the ion implantation layer.

The Office Action asserts that steps (ii) to (vi) are disclosed in Bruel '835. The Office Action admits that Bruel '835 does not disclose step (i). However, the Office action asserts that a process of forming an insulation film (i.e., process (i)) is disclosed in Bruel '564, and that it would be obvious to one of ordinary skill in the art to incorporate this disclosure of Bruel '564 into Bruel '835. This assertion is respectfully traversed for at least the reasons discussed below.

A. Recitation of "On the Insulation Film"

Claim 1 recites forming an ion shield member having a predetermined shape on the insulation film. This step clearly recites that the ion shield member is formed on the insulation film. Therefore, the ion shield member can be formed only on the parts necessary for obtaining the effect of shielding from an ion implantation.

The Office Action asserts that Bruel '835 discloses this claimed feature. This assertion is traversed. Specifically, in Bruel '835, screen 23 is used for controlling the ion implantation shown in Fig. 5. Screen 23 is apart from wafer 20. Therefore, screen 23 necessarily has thick parts 27, 28 and thin parts 24, 25, 26. In other words, not only the thick parts for obtaining the effect of shielding from the ion implantation, but also the thin parts for obtaining the effect of the relatively strong ion implantation, are needed. Since screen 23 is apart from wafer 20, the thin parts are necessary to support the thick parts. This means that screen 23 must be formed so as to be covered with the whole of wafer 20.

Contrarily, according to the method recited in claim 1, the thin parts are not needed because the ion shield member is formed on the insulation film, and therefore it is supported by the insulation film. Thus, according to the method recited in claim 1, it is enough to form the ion shield member only on the parts necessary for obtaining the effect of shielding from an ion implantation. Neither Bruel '835 nor Bruel '564 disclose this claimed feature.

B. Lamination Method

The method recited in claim 1 basically uses a lamination method. In the lamination method, good adhesion between a semiconductor substrate and a support substrate is required. To obtain good adhesion, an insulation film is formed between the semiconductor substrate and the support substrate. To this end, claim 1 recites forming an insulation film.

Bruel '835 does not disclose a technique to obtain good adhesion between a semiconductor substrate and a support substrate. However, the Office Action asserts that Bruel '564 makes up for this deficiency. This assertion is respectfully traversed.

Bruel '564 does not disclose a technique to obtain good adhesion. Bruel '564 does disclose formation of an encapsulating layer, however this encapsulating layer is used as to reduce the penetration of ions in the semiconductor for producing finer membranes, or to protect the semiconductor from possible contamination, or to control the physicochemical state of the semiconductor surface (col. 2, line 61 – col. 3, line 9). Thus, Bruel '564 does not disclose a technique to obtain good adhesion between a semiconductor substrate and a support substrate using an insulation film. Therefore, even if Bruel '564 is incorporated into Bruel '835, no motivation exists to combine and modify these references to result in the claimed invention.

C. Forming Insulation Film Before Ion Implantation

In accordance with the claimed invention, an insulation film is formed before ion implantation is performed. Therefore, good adhesion by the insulation film can be obtained while preventing micro cavities from forming at a peak position of an ion implantation layer. If an insulation film is formed after ion implantation is performed, the high temperature generated in a CVD process or a thermal oxidation process forms the micro cavities at the peak position of the ion implantation layer. According to the method recited in claim 1, it is possible to prevent the generation of micro cavities. The applied art does not disclose this feature.

For at least these reasons, it is respectfully submitted that claim 1 is distinguishable over the applied art. Claims 2-4 and 9, which depend from claim 1, are likewise distinguishable over the applied art for at least the reasons discussed, as well as for the additional features they recite. Withdrawal of the rejections under 35 U.S.C. §103(a) is respectfully requested.

III. CONCLUSION

For at least these reasons, it is respectfully submitted that this application is in condition for allowance.

Should the Examiner believe that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is requested to contact the Applicants' representative at the telephone number listed below.

Respectfully submitted,

James A. Oliff
Registration No. 27,075

Eric D. Morehouse
Registration No. 38,565

JAO:EDM/gam

Attachments:
Appendix
Petition for Extension of Time

Date: December 2, 2002

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
Charge any fee due to our Deposit Account No. 15-0461

APPENDIX

Changes to Specification:

Page 20, line 14 – page 21, line 2:

By the above-mentioned processes, it is possible to manufacture the semiconductor substrate 7 having the single crystal semiconductor layer ~~1b~~ 1c in which the thicknesses are different depending on the portions. In this embodiment, the example is described in which one semiconductor substrate 7 is manufactured. In practice, however, the above-mentioned processes are done by using a large size of a manufacture support substrate through which a plurality of semiconductor substrates can be manufactured. Then, it is cut into individual semiconductor substrates after the semiconductor substrate is manufactured or after the semiconductor device is formed on the semiconductor substrate. The employment of such a manufacturing process makes it possible to achieve more efficient manufacturing process in which the variation in the product is small. Hence, it is possible to improve the yield.

Changes to Claims:

Claims 5-8 and 10-16 are canceled.